Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Previously presented) An apparatus for determining the concentration of scale-forming ions; the apparatus comprising:

a ligand which binds scaling ions in a sample of fluid, said ligand having an electronic configuration which is altered on binding of a scaling ion, wherein the ligand is a BAPTA derivative and said ligand ~~being~~ is configured to be placed in the vicinity of a flow of said fluid; and

a detector for determining alterations in said electronic configuration, the amount of said alterations being indicative of the concentration of the scaling ion in the sample.

2. (Original) An apparatus according to claim 1 wherein the scaling ion is selected from the group consisting of Ca2+, Ba2+ and Sr2+ ions.

3. (Previously presented) An apparatus according to claim 1 wherein the detector comprises one or more electrodes for determining changes in the electroactivity of said ligand.

4. (Original) An apparatus according to claim 3 wherein the ligand is immobilised on conducting particles attached to one or more of said electrodes.

5. (Original) An apparatus according to claim 4 such that wherein said conducting particles are carbon or metal particles.

6. (Original) An apparatus according to claim 5 wherein the metal particles are gold particles.

7. (Previously presented) An apparatus according to claims 4 wherein said particles with immobilised ligands thereon form a conducting porous electrode.

8-10. (Canceled)

11. ((Currently amended) An apparatus according to claim 1 comprising a processor for calculating the concentration of the scaling ion in the sample ~~water~~ from alterations in the electronic configuration of the ligand.

12. (Currently amended) An apparatus according to claim 11 ~~comprising a~~ wherein the ligand ~~binding~~ binds two or more different scaling ions and ~~generating~~ generates a different electronic configuration in response thereto.

13. (Currently amended) An apparatus according to claim 11 comprising two or more different ligands, said detector being adapted to determine alterations in the electronic configuration of each of the different ligands independently.

14. (Original) An apparatus according to claim 13 wherein each of the said two or more ligands binds to a different combination of scaling ions.

15. (Currently amended) An apparatus according to claim 1 further comprising a porous membrane which allows ions from the fluid to contact the ligand.

16. (Original) An apparatus according to claim 15 wherein the membrane is ceramic or zeolite.

17. (Currently amended) An apparatus according to claim 1 ~~comprising~~ wherein the ligand~~s~~ is embedded in a block of porous material, said block being exposed to ~~a~~ the fluid flow.

18. (Previously presented) An apparatus according to claim 1 wherein the fluid is a wellbore effluent.

19. (Previously presented) An apparatus according to claim 1 wherein the fluid stems from a production flow from a wellbore.

20. (Previously presented) An apparatus according to claim 1 being adapted to be placed in a subterranean location.

21. (Currently amended) A method of monitoring the concentrations of scaling ions comprising[;]:

contacting a fluid flow with a ligand which selectively binds scaling ions, wherein the binding of scaling ions in said sample to the ligand alters the electronic configuration of the ligand, wherein the ligand is a BAPTA derivative [:];

measuring changes in the electronic configuration of the ligand; and[,]

determining the concentration of said scaling ion from said change in the electronic configuration.

22. (Original) A method according to claim 21 wherein the scaling ions are selected from the group consisting of Ca2+, Ba2+ and Sr2+ ions.

23. (Previously presented) A method according to claim 21 wherein the change in electronic configuration is determined by measuring alterations in the electroactivity of the ligand.

24. (Canceled)

25. (Canceled)

26. (Currently amended) A method according to claim 21 comprising contacting the sample with two or more different ligands and determining alterations in the electronic configuration of each of the two or more ligands.

27. (Original) A method according to claim 26 wherein each of the said two or more ligands binds to a different combination of scaling ions.

28. (Previously presented) A method according to claim 21 including the step of monitoring the production of a wellbore.

29. (Previously presented) A method according to (Previously presented) including the step of predicting the scaling of hydrocarbon production tubulars or equipment.

30. (Previously presented) A method according to (Previously presented) including the step of monitoring the scaling of hydrocarbon production tubulars or equipment in a downhole location.

31. (Previously presented) A method according to claim 21 wherein the ligand binds two or more different scaling ions and generates a different electronic configuration in response thereto.